Amendments to and Listings of the Claims

Please amend claims 1 and 12 as follows. Please cancel claim 2 and 13 without prejudice or disclaimer. This listing of claims will replace all prior versions and listing of claims in the application:

CLAIMS

1.   (Currently Amended) Method for bending a portion (24) of an element (11) in a bending machine (12), comprising at least a bending assembly (14), a supporting plane (18) on which said element (11) is retained by an arm (16), and an electronic processing unit (32), wherein the bending process is filmed by image acquisition means (26) and displayed on display means (36), the method comprising a step of setting a nominal value ("γ") of the angle of bend to be obtained, characterized in that it provides that:

the arm (16) is kept pressed on a segment (22) of said element (11) adjacent to said portion (24) during the whole bending cycle in order to guarantee a safe reference;

the movement of the bending assembly (14) to make said first bend is acquired by a position transducer (15) and recorded by said electronic processing unit (32);

a first reference indicator ("Z") is positioned on said display means (36), with respect to a reference axis ("X") aligned with said supporting plane (18), to make a first bend of a nominal value ("γ");

the value of an angle of deviation ("α") is determined, caused by the elastic return of said bent portion (24) and a second reference indicator ("Z'") is positioned, wherein the angle of deviation ("α") is taken into account;

the portion (24) is bent with a new movement of said bending assembly (14) until it aligns with the second reference indicator ("Z'");

the new movement of said bending assembly (14) is acquired by said position transducer (15) and recorded by said electronic processing unit (32) in order to have a global parameter for obtaining an angle which, taking into account the value of the angle of deviation ("α") for that element (11) and of the angle of said first bend, corresponds univocally to said

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nominal value (γ), and in order to use said global parameter in subsequent analogous or similar bends.

2.   (Canceled)

3.   (Previously Amended) Method as in claim 1, characterized in that the drive of said bending assembly (14) is carried out manually by means of commands (39, 41, 43).

4.   (Previously Amended) Method as in claim 1, characterized in that the drive of said bending assembly (14) is carried out automatically on commands of said electronic processing unit (32).

5.   (Previously Amended) Method as in claim 1, wherein said bending assembly (14) is driven, at least partially, by means of an impulse command, wherein an angle of partial bending, as acquired by said position transducer (15), corresponds to each impulse, characterized in that said electronic processing unit (32), during bending, algebraically adds together the total number of impulses, positive and negative, that is, with a deviation in one direction or the other of the bending assembly (14), necessary to actually obtain the value of said nominal angle ("γ").

6.   (Original) Method as in claim 5, characterized in that the drive of the bending assembly (14) is carried out continuously until said bent portion (24) is at a certain distance from the position of said first reference indicator (Z) and then is brought progressively closer by means of impulses in order to prevent the nominal angle (γ) to be obtained from being exceeded.

7.   (Previously Amended) Method as in claim 1, characterized in that the alignment between the bent portion (24) and the reference indicators ("Z, Z'") is visually verified on each occasion on said display means (36).

8.   (Previously Amended) Method as in claim 1, characterized in that the alignment between the bent portion (24) and the reference indicators ("Z, Z'") is signaled automatically.

9.   (Previously Amended) Method as in claim 1, characterized in that the calculation of said angle of deviation ("α") provides that on said display means (36) a virtual straight line (Y) is generated on each occasion aligned with said bent portion (24), and that the angle is calculated between said virtual straight line (Y) and the first reference indicator ("Z").

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10.   (Previously Amended) Method as in claim 1, characterized in that the calculation of said angle of deviation ("α") provides that on said display means (36) a system of coordinates is displayed, divided into a plurality of angular sectors to each of which is attributed a range of values of angles with respect to a reference axis ("X"), and that, displaying the position of said bent portion (24), the angle of deviation ("α") is obtained as a function of the angular sector in which the portion (24) is located.

11.   (Previously Amended) Method as in claim 1, characterized in that the calculation of said angle of deviation ("α") provides that the reference indicator ("Z") is displaced until it aligns with the position of the bent portion (24) and the angle of deviation made is calculated.

12.   (Currently Amended) Device for bending a portion (24) of an element (11) comprising a bending machine (12) including at least a bending assembly (14), a supporting plane (18) on which said element (11) is retained, an electronic processing unit (32), image acquisition means (26) able to film the bending process, and display means (36) able to display said images, characterized in that it comprises:

a pressing arm (16) for pressing on a segment (22) of the element (11) adjacent to said portion (24) during the whole bending cycle in order to guarantee a safe reference.

setting means, able to set on said display means (36) a first reference indicator ("Z") angled, with respect to a reference axis ("X") aligned with said supporting plane (18), by an angle correlated to a nominal angle ("γ") to be obtained;

a position transducer (15), associated with said bending assembly (14), able to acquire the movement of said bending assembly (14) for the alignment of said portion (24) by a first bend with said first reference indicator ("Z"), said position transducer (15) being connected to said electronic processing unit (32) for the recording of said movement;

means to calculate the angle of deviation ("α") caused by the elastic return of the bent portion (24) in order to position a second reference indicator ("Z'") in a position that takes into account said angle of deviation ("α");

said position transducer (15) and said electronic processing unit (32) are able respectively to acquire and to record a new movement imparted to said bending assembly (14) to align said portion (24) with said second reference indicator ("Z'"), in order to have a global

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parameter for obtaining an angle which, taking into account the value of the angle of deviation ("α") for that element (11) and of the angle of said first bend, corresponds univocally to said nominal value (γ) and in order to use said global parameter in subsequent analogous or similar bends.

13.   (Canceled)

14.   (Previously Amended) Device as in claim 12, characterized in that said image acquisition means (26) consist of at least a TV camera (26) facing in the direction of the bending axis (A).

15.   (Previously Amended) Device as in claim 12, characterized in that said bending assembly (14) is associated with an actuation assembly (17) having the commands (39, 41, 43) for the drive functions of said bending assembly (14), at least part of said commands being associated with said position transducer (15) in order to find the parameters relating to said drive of the bending assembly (14).

16.   (Original) Device as in claim 15, characterized in that at least part of said commands (39, 41) are able to command a drive of said bending assembly (14) according to impulses, each impulse corresponding, as acquired by said position transducer (15), to a fraction of an angle.

17.   (Original) Device as in claim 16, characterized in that said electronic processing unit (32) is able to algebraically add together the command impulses of said bending assembly (14) necessary to obtain the desired angle of bend ("γ"), to record the value of said sum and to use said value for subsequent analogous or similar bends.

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